AMSAT SATELLITE REPORT

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HR Report *Editor Retires*

Joe Schroeder, W9JUV, founder and Editor of *HR Report* has announced his retirement from the bi-weekly publication effective January, 1982. Joe is an AMSAT Life Member and his regular coverage of the satellite scene on page 3 (and occasionally page 1) of *HR Report* has put AMSAT's activities prominently before the eyes of thousands of readers in the general Amateur Radio community. This coverage has provided very positive benefits in terms of exposure and, significantly, aided in fund-raising efforts. The new Editor is Bill Pasternak, WA6ITF, of *Westlink* fame.

Joe will have completed eight years at the helm and will now have more time to apply to his advertising business and his other writing activities. He will, in any case, continue as a contributor and reporter for *HR Report*. Well done, Joe!

UO-9 Modems; W6HDO Followup

A surprisingly heavy response to *ASR's* offer of a 1200 baud demodulator circuit design by W6HDO is evident. A schematic, parts list and explanation of this one-chip modem have been mailed to about 50 requestors. Those who have received the drawings should assure that pin 4 of the 2211 IC is grounded. Pin 4 is the power return line. The ground was omitted in the drawing. Interest is high in interfacing the UoSAT-OSCAR 9 1200 baud telemetry to home computers. WA2LQQ has obtained a very limited number of quality 202-type modems for those who might choose to buy rather than build. The modems are complete in all respects (power, cabinet, cables, docs) and have been specifically obtained to support UO-9 operations as well as AMICOM Packet Radio communications. Check on availability with WA2LQQ, P.O. Box 177, Warwick, NY 10990. SASE.

"20th" Certificate Offer

On December 12, 1961, OSCAR 1 was born. To commemorate this milestone in amateur annals AMSAT is producing a handsome 20th Anniversary certificate for all those who participate in AMSAT activities in any of a number of ways from 12 Dec. 81 through 12 Jan. 82. To claim your certificate simply check-in to any AMSAT affiliated net, or work through any satellite, or copy telemetry from any of the birds. If you cannot do any of the preceeding, then simply explain what your plans are for becoming involved with the Amateur Space Program in the future. Send your request to arrive not later than 31 Jan. 82 to: WA2LQQ, P.O. Box 177, Warwick, NY 10990. Be certain to include a #10 (business sized) SASE for your certificate. (25 cm x 10 cm minimum). If you wish to receive your certificate in unfolded condition, then make your SASE 26 cm x 21 cm (10" x 8") or larger. Finally, include your AMSAT member number together with your request. This offer is open to all amateurs but current members will receive the deluxe certificate. Potential and lapsed amateurs will receive a reasonable facsimile.

Member Renewals

Annual AMSAT member renewal documents were being printed at press-time. They should be in the mail shortly. If you have already renewed, please ignore the renewal notice. All current members and many lapsed members will receive an annual report from AMSAT President Dr. Tom Clark, W3IWI.

QEX *Debuts*

The premier edition of ARRL's experimenter's newsletter, *QEX*, has been mailed to all charter subscribers. *QEX* is targetted on the advanced experimenter who would be interested in the topics of, for example, low noise preamps for vhf and above, spread spectrum rf communications, Packet Radio, coherent cw and the like. *QEX* Editor Paul Rinaldo, W4RI, is President of AMRAD, the Amateur Research and Development Corporation and is uniquely qualified for the editorship. AMRAD has enjoyed a close, often symbiotic relation with AMSAT and many individuals belong to both organizations. The newsletter's stated explicit purpose is to promote advanced technical enterprise by present or would-be experimenters and to provide a media for exchange of ideas germane to such activities. Subscription information may be obtained by contacting W4RI at: 1524 Springdale Ave., McLean, VA 22101. A #10 SASE would help expedite responses.

"CCD Display PCBs Soon"

Ron Broadbent, G3AAJ, AMSAT UK Secretary, announces that the long-heralded interface boards for displaying UoSAT OSCAR 9 imagery will soon be available. Ron advises that the unpopulated board set consists of 4 PCBs of aerospace quality and will be priced "in the neighborhood" of $30 U.S. The function of the completed device is to interface your VHF/UHF receiver to your commercial TV and allow the imagery transmitted by UoSAT OSCAR 9 to be displayed on the TV. The circuit is switchable from the 525 line TV U.S. standard to the 625 line TV used in UK and other parts of Europe. Please do not order yet as the final price and delivery have yet to be specified. Best advice for now is to post a SASE (or SAE w/IRCs) to: AMSAT UK, G3AAJ, London, E12 5EQ, England. Ron will inform you by return mail what the ordering details will be as soon as they are finalized.

In related UoSAT developments, the University of Surrey UoSAT Laboratory has established a call-in service. If you call 483-61202 in Surrey, you will be greeted by a recorded announcement detailing the latest on the UO-9 progress.

At this writing there was a possibility that UO-9 would have its Engineering Evaluation Phase complete by Christmas. The attitude adjustment regime was about to be implemented and following that the gravity gradient boom would be deployed. At that time tests of the hf beacons would likely commence. All going well, the satellite might be in full operations garb to greet the new year. UO-9 observed its second major geomagnetic storm mid-November and bolstered the experimenters' confidence further that instruments are functioning well. A test of the CCD camera on dark-sky yielded the expected result (no anomalies) and that system appears to be ready for full testing pending attitude adjustment. The team at Surrey is understood to be working at a furious pace to complete the initial testing of UO-9. Meanwhile, as the amateur community gets to know UoSAT OSCAR 9, a growing interest in receiving the telemetry is evident at *ASR* as a result of a significant number of inquiries about demodulators (See *ASR*#21, pg. 2).

TAD Award For OSCARites

The Lockheed E.R.C. Amateur Radio Club (W6LS) announces its Ten American Districts (TAD) award to recognize operating achievements. The TAD award is available to all licensed amateur radio operators and amateur radio clubs. Contacts with all ten United States callsign areas must have been made from the same callsign area (such as W4, G2 or VE3). However, not all contacts must be from the same QTH in that callsign area.

A hand-printed endorsement will be added to the award (at your request) for OSCAR. Additional endorsements are available for CW, RTTY, SSTV, QCWA, YL, 10-X and others. Complete rules may be requested with a #10 SASE to:

Amateur Radio Station W6LS
2814 Empire Avenue
Burbank, CA 91504 USA

Ten Meter QRM on Rise

One unpleasant fallout of the recent RS salvo launch has been a focus of attention on a growing dilemma. Specifically the level of activity in the 29 MHz segment of the 10-meter band seems higher than ever. All sorts of activities are evident now in a zone to which Mode A downlinks had nearly free rein but a few years ago.

Ten meter fm is on the rise; repeaters with ten meter links abound; there is a general ignorance on the part of most occupants of the 29.3 to 29.5 MHz range that any but terrestrial communications transpire there. Significantly, moreover, most non-satellite users of 29.3 to 29.5 are not equipped to hear the normally weak Mode A downlinks of AO-8 and the RS's. What seems in order, then, is a renewal of the information program of several years ago. Under this concept stations causing interference to satellites would be politely informed that they were adversely affecting satellite communications. The general areas of the Mode A downlinks would be mentioned and then the non-satellite user would be left to decide for himself if and when it might be helpful for him to QSY elsewhere.

As quasi-weak signal users of 10 meters, we have absolutely *no claim* for exclusive use of this or any band. Therefore we must appeal to the cooperative spirit of most amateurs and approach them politely with a healthy respect for *their* rights of occupancy. Failing with the rational approach we must occasionally admit that incorrigibles exist and consequently zero levels of mutual interference are unattainable.

Project OSCAR (North) Meets

The RF Group of Project OSCAR met in San Francisco 14 Nov. to further plans for the SYNCART project. SYNCART would be the world's first amateur geosynchronous satellite if events unfold as planned. The SYNCART project is a collaboration of AMSAT Canada and Project OSCAR. Attending the meeting were John Pronko, W6XN, President; Jim Eagleson, WB6JNN, Project OSCAR Technical Director; Paul Shuch, N6TX, 23 cm Project Engineer; Bob Stein, W6NBI, 70 cm Driver/PA Engineer; Nick Marshall, W6OLO, Filters Engineer; and Ray Maxwell, WA6VAB, Components Engineer. Discussed at the meeting: a) Plans to begin funding and supporting SYNCART from Project OSCAR resources to free AMSAT resources for the Phase III program. b) The Project OSCAR 23 cm linear transponder will be put back on the air for use by the packet repeater, KA6M. c) The SYNCART prototype modules are scheduled for evaluation in mid January. d) Frequencies have been chosen for the 23 cm linear transponder and for the SYNCART transponder. e) An i-f section is coming from AMSAT Canada. f) A working prototype of the 435 MHz predriver exists and meets the specs.

With regard to frequencies for SYNCART, the following were opted for prototyping at least.

Uplink	145.5 to 145.8 MHz
Uplink	1269.7 to 1270.0 MHz
Downlink	435.7 to 436.0 MHz

An AMSAT Satellite Report Exclusive:

Radio Sputnik's Alive in Orbit!!!

In a space spectacular unique in all the history of Amateur Radio, the Amateurs of the Soviet Union took a giant step with the simultaneous launch 17 Dec. of six new Sputniks. At this writing the Amateur world was abuzz with talk of the space achievement and how it will affect the Amateur Community in general and the Amateur Satellite Community in particular.

The TASS (Soviet) News Agency reported the launch as follows:

Moscow, 18 Dec. (TASS)—Artificial Earth Satellites, Radio-3, Radio-4, Radio-5, Radio-6, Radio-7 and Radio-8 were launched in the Soviet Union on December 17. All the six satellites were orbited by one carrier rocket.

The satellites have on board apparatus for communication betwen radio hams and a radio telemetric system for transmitting back to earth data on the work of the on board apparatus.

All the six satellites are following orbits close to the calculated ones. Their initial parameters are: The Period of Revolution-120.9 min; Maximum Distance from the Earth (Apogee)-1794 kilometres; Minimum Distance from the Earth (Perigee)-1685 kilometres; The Orbit's Inclination-83 degrees.

The apparatus aboard the satellites is functioning normally. Sessions of communications via the satellites will be held according to program. Data needed for organizing communication between amateur radio operators will be published in the press.

Ground receiving and command centres control the work of the satellites as well as receive and process the incoming information.

The International Registration Index of the "Radio" satellites is RS.

The satellites Radio-3, Radio-4, Radio-5, Radio-6, Radio-7, Radio-8, and the ground receiving and command centres were created by organizations of radio hams of the USSR who dedicate the launching of these satellites to the 40th anniversary of the victory of Soviet troops near Moscow.

This edition of *ASR* will be largely devoted to the new RS's. Some of the information is very recent and remains unconfirmed. On the other hand, much of the early information has since been confirmed either by reliable observers or the Russian Program manager himself, UA3CR.

Word of the launch spread quickly the morning of Thursday, 17 Dec. with many Amateurs having been alerted to watch for the launch around the mid-week period. Thus, when the call arrived at *ASR* offices early Thursday, K1HTV's exclamation was not totally unanticipated. "They're up!" he exclaimed with unmistakable enthusiasm. Special AMSAT Nets were held on 3850 kHz for the rest of the week to help spread the word.

With this edition of *ASR* we note the closing of the calendar year, the 20th anniversary of OSCAR 1's launch and a spectacular achievement in amateur space technology. What a way to close out the year!!

Transponder and Autoresponder Frequencies

At this writing the frequencies of operation of most of the modules aboard the six new Russian satellites were becoming known. Moreover, there are six complete transponders and three autoresponders (robots) in orbit. RS-3, 5 and 7 each have a transponder and autoresponder while RS-4, 6 and 8 have only the transponders. The following frequencies are the best available at press time:

Sat #	Uplink Freq.	Downlink Freq.	Beacons
RS-3	145.820- .900	29.360-.400	29.321, .401
RS-4	145.860- .900	29.360-.400	29.360, .403
RS-5	145.910- .950	29.410-.450	29.331, .452
RS-6	145.910- .950	29.410-.450	29.411, .453
RS-7	145.960-6.000	29.460-.500	29.341, .501
RS-8	145.960-6.000	29.460-.500	29.461, .502

Autoresponders:

Sat #	Uplink Freq.	Downlink Freq.
RS-3	145.820	29.320
RS-5	145.826	29.331
RS-7	145.840	29.340

Robot Access Procedures Told

Although the story authored by G3IOR in the June/July 1980 *ORBIT* has been an enormous help in coming to understand the nature of the new RS's, some updates are needed. For example the format for accessing the robots on RS-3, 5 and 7 is different in a small but critical way. The procedure for accessing is exemplified as follows assuming your callsign is G3IOR and you wish to access RS-5.

First you must listen for RS-5 to call CQ on its robot beacon frequency of 29.331 MHz. When you hear it, tune your 2-meter transmitter to about 145.830 and send a series of dots. When you hear your dots being regenerated from the downlink of RS-5, you'll know you are within the capture range of the robot receiver. Then begin you call as follows:

"RS5 de G3IOR AR"

If successful the RS-5 robot should respond as indicated below. Try to send clean cw at about the same speed you hear the robot. Apparently you need not be too accurate because the robot will adapt to your speed after a short training period. K1HTV reports the robot can slew from about 10 wpm to about 20 or 25 wpm. If the robot did not get your call clearly you may hear a "QRZ" or "QRM" or a "RPT". In this case you should simply try again. If you hear a "QRQ" the robot wants you to send faster. Conversely, a "QRS" would require you to slow down a bit. It appears the robot(s) are moderately liberal in the cw proficiency it will accept. When you are successful you will hear the following from, say, RS-5:

"G3IOR de RS5 QSO nr xyz G3IOR de RS5 QSO nr xyz OP ROBOT T U FR QSO 73 SK"

The letters "xyz" represent a three digit QSO serial number that will be incremented once for each QSO yielding a unique QSO number for each QSO up to 999.

The transponder access is standard and anyone having worked Mode A in the past will have no problem here with the new RS birds. Be wary at all times of your uplink power as the new RS receivers are very sensitive and need only perhaps 20 or 30 watts ERP for an excellent downlink signal to result. That power level of 30 watts ERP applies to the receivers when the on-board attenuatorsare NOT activated as indicated by telemetry channel MW or WW. (See telemetry information in another article in this *ASR*).

Greg Roberts, ZS1BI, reports that the robots will be calling CQ about once in 59 seconds when active and that should be your clue to participate.

Your reports of activities to *ASR* will be appreciated and the best ones will be published as space allows.

New Birds Have Same Orbits as RS-1/2

The new Radio Sputniks have orbits very similar to those of the first two RS's which were launched in October, 1978. In rough terms, the orbits are described as follows:

The orbits are circular, polar, pro-grade (inclination less than 90 degrees). The altitude is roughly 1658 km (1030 statute miles). The orbit is one most often associated with an earth resources mission. The precise numbers are as follows:

Sat. #	Apogee (km)	Perigee (km)	Period (min)	Incr. (deg)	Incl.(deg w/orb)
RS-3	1688.0	1577.4	118.52025	29.75679	82.9592
RS-4	1691.5	1640.5	119.39679	29.97606	82.9603
RS-5	1689.9	1653.2	119.55572	30.01583	82.9629
RS-6	1690.9	1592.5	118.71899	29.80655	82.9542
RS-7	1688.9	1634.2	119.19576	29.92619	82.9629
RS-8	1693.4	1657.1	119.76628	30.06853	82.9570

Those using the W3IWI program will want to use the Keplerian elements shown in Table 1 for that program. Please note that these data are fairly early and so should be updated with more recent data when available.

The reference numbers for the new RS's are as follows:

Satellite Designation	NASA Object #	International Catalog #
RS-3	81-120A	12997
RS-4	81-120D	13000
RS-5	81-120C	12999
RS-6	81-120F	13002
RS-7	81-120E	13001
RS-8	81-120B	12998

Use the catalog numbers to request satellite tracking data from official government agencies.

Reference orbits for 28 Dec. 81 are as follows (please do your own extrapolation to useable dates based on the data given above):

Satellite Designation	Time of EQX	Longitude of EQX
RS-3	01:23:30	204.0
RS-4	01:16:24	202.1
RS-5	01:36:36	207.2
RS-6	01:48:58	210.4
RS-7	00:50:58	195.8
RS-8	00:04:00	183.8

Individuals using manual locators such as the Satellabe and OSCARlocator will find that the range circles of OSCAR 7 will provide usable accuracy and that the ground track of RS-1, if available, will be very accurate. W9KDR and W9MXC report that a suitable overlay set for use with the new RS birds will be found in a future Mode J Club Newsletter. The scale will be set so as to be useable with the new ARRL locator package which is available from AMSAT Headquarters for $7 plus $1 postage/handling. Write: AMSAT, P.O. Box 27, Washington, D.C. 20044.

RS Telemetry Decoded

The first indications of the existance of the new RS satellites in the West was the appearance in *ORBIT* June/July 1980 of G3IOR's article (pgs. 17-19). Because of the importance of the Tables included in that article, it is

Editor's Note: Last minute late-breaking information reports that an article in *Sovieteskiy Patriot* dated December 27, 1981, describes the new Russian Satellites. According to the article, RS3 and RS4 have neither robots or transponders aboard, just beacons.

Table I

	RS-3	RS-4	RS-5	RS-6	RS-7	RS-8
Ref. Epoch	82-352.42821526	81-352.51786506	81-352.43615239	82-352.51220885	81-352.51617870	81-352.43778284
Der. Mean Motion	4E-8	4E-8	4E-8	4E-8	4E-8	4E-8
Inclin.	82.9592	82.9603	82.9629	82.9542	82.9629	82.9570
RAAN	278.6247	278.6053	278.6468	278.5724	278.5657	278.6150
Eccen.	0.0059909	0.0018414	0.0008995	0.0051758	0.0022846	0.0017913
Arg. of Perigee	95.7099	143.1071	170.9112	107.1050	109.0146	147.6395
Mean Anomaly	265.0726	217.1104	189.1955	253.5810	251.3076	212.3476
Mean Motion	12.15563035	12.06632531	12.05025077	12.13529253	12.08658540	12.02909195
Element set	10	6	5	5	6	5
Rev. #of Ref. Epoch	12	13	12	13	13	12

reprinted in part below. Though some minor factors have changed, the majority of the information appears to remain valid with regard to RS-3 through 8.

There are in fact, thirty-five parameters in all, despite the seven letter prefixes, the others of which can be identified with an additional 'dit' in front of K, D, O, etc. making them sound like different letters. 'D' would sound like 'L', 'O' like 'J' and so on. See Tables II and III. The actual format can be the same, depending on whether the service channel is on or not, thus no prefix, a straight K, D, O, G, U, S, W sequence would indicate things are quiet apart from the beacon, while 'EK', 'ED', 'EO' etc., would be sent when all is going.

Thus, with activity, prefix goes to 'E' prefix, the 'I' preprefix can go to 'S', e.g. 'IK' to 'SK', 'ED' to 'SD', etc., the normal non-active 'N' prefix to 'R', the normal 'A' to 'U', and the normal 'M' to 'W', all by the extra 'dit' of information. For the second channel, some of the information such as the output power of the transponder and the means of calculation are the same, but other interpretations are now employed. See Table III.

The transponder, like the previous, being designed with the USSR two-meter five-watt power limitation in mind, shows superb sensitivity, and was producing good signals from OSCAR-7 on Mode-B downlink to its output on ten-meters, with its 145.910-950 MHz input to give 29.410-450 MHz output. A further innovation is a codestore system with a capacity of one hundred characters, which has been used to give out messages about the transponder, on 29.330 MHz e.g. "CQ. . . . Transponder RSØ is testing Rx 145.910/950 MHz Tx 29.410/450 MHz Pse QSL via Moscow Box 88 RS3A."

The TLM can dwell on any one channel continuously, in which case, the "RSØ" normally finalizing each run of telemetry is negated. The transmitters can also be placed into two different power levels, indicated by the 'MG' and 'MU' prefixes. The testing of the units will be from 1200 to 1230 each Saturday, Moscow time. Reports are appreciated, written, or on frequency 29.445 or 330 via F2 when the band is open.

Perhaps the most exciting feature of all is the autoresponder that has been successfully tested to me by demonstration. When it is called on 145.830 MHz it will respond on 29.330 MHz and actually conduct a contact with the station whose call it identifies. It will call CQ on 29.330, and the station needing a QSO should call "RSØA de (your call) AR." The response will come back: "(Your call) de RSØ QSO Nr 001 (your call) de RSØ QSO Nr 001 OP ROBOT T U FR QSO 73 SK" and then await the next caller. It will presumeably be assigend "RS-3" or the like once in orbit, and serialize the QSO number.

Table II - RS Satellite First Channel

Letter	Content	Calculation
K	Output power	$0.2 \times N^2$ = op in mW of transponder
D	Voltage of source	n x 0.2 = power source in volts
O	Charge current	20 x (100 − n) = charge in mA
G	Believed to be TLM calibration constant test level	
U	Not given	
S	Temp. Regulator	T = n = Temp. of Voltage Regulator in C
W	Temp. 10m TX cooling fins	T = n = Temp. of 10-meter output stage in C

Table III - RS Satellite Other Channels

Second Channel: Prefix, 'I' or (active) 'S', eg. 'IK' or 'SK', 'ID' or 'SD' etc.

Letter	Content	Calculation
K	Output pwr transp.	As previous
D	Zero adj. of TLM	Figure given
O	Beacon output pwr	$0.2 \times N^2$ = Beacon output in mW
G	Sensitivity transp.	N = −dB (regulated)
U	'S' meter 1st RX	0.1 x (N − 10) = 'S' units
S	'S' meter ROBOT RX	as above
W	'S' meter 2nd service RX	as above

Third Channel: Prefix 'N' (quiet) or 'R' (active) eg. 'NK' or 'RK' etc.

K	As previous two 'K' channels
D-W	Regret no further information yet to hand

Continued on next page.

Continued from previous page.

Fourth Channel: Prefix 'A' (inactive) or 'U' (active)
e.g. 'AK' or 'RK' etc.

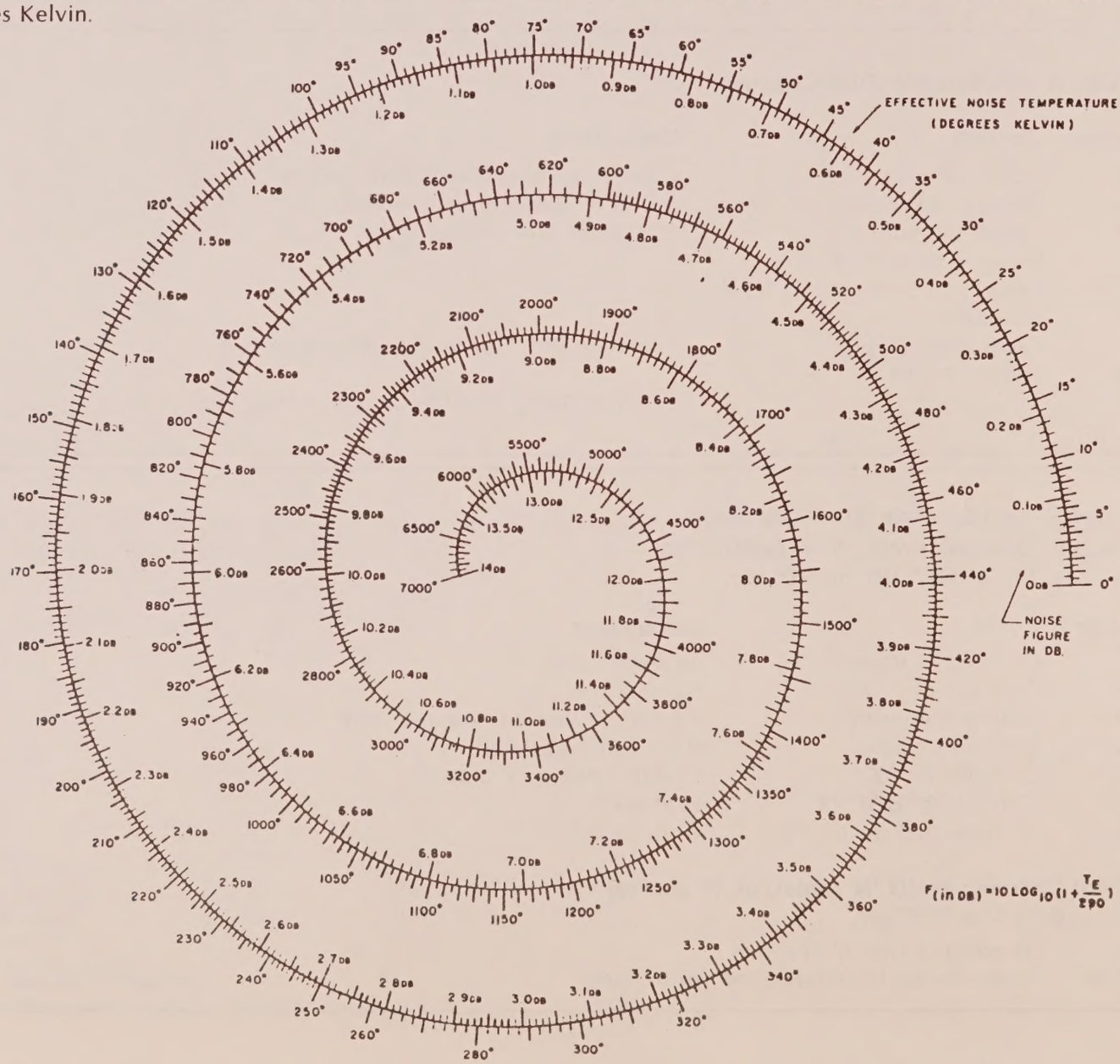
K	Output power of transponder	as previous
D	9V transponder line	0.1 x N = transponder supply 'V' in volts
O	7.5V transponder line	as above
G	9V 1st stabilizer	as above
U	7.5V 1st stabilizer	as above
S	9V 2nd stabilizer	as above
W	7.5V 2nd stabilizer	as above

Fifth Channel: Prefix 'M' (inactive) or 'W' (active)
e.g. 'MK' or 'WK' etc.

K	Output power of transponder	as previous
D	On board log	N = no. of QSO's ±1 (assumed on ROBOT)
O	Heater radiation control	N x 0.1 = watts, power of heating system
G	ROBOT input power	n x 20 = power in mW
U	Power of service channel	n x 20 = nW (assumed to be transponder Wt)
S	Sensitivity pad of ROBOT	N = −dB of ROBOT RX
W	Sensitivity of service RX	N = −dB

An ASR Technical Note: *Noise Figure vs. Noise Temperature.*

Ever wonder what the conversion was between the two? The conversion plot below presents the conversion either way. For those needing an exact solution, the equation shown provides noise figure in dB given the noise temperature in degrees Kelvin.



ASR *Spotlight On: Jorge Ordonez*

This spotlight focuses on the present appointee in the AMSAT "Intern Program." "Intern" evokes thoughts of medical talents, and indeed there is an apt parallel here—the tasks necessary for the assembly of a spacecraft as complex as the new AMSAT Phase IIIB often demands skill and precision worthy of a surgeon. (As an aside it may be noted that our subject has a brother who is a practicing neurosurgeon—Coincidence? Perhaps!)

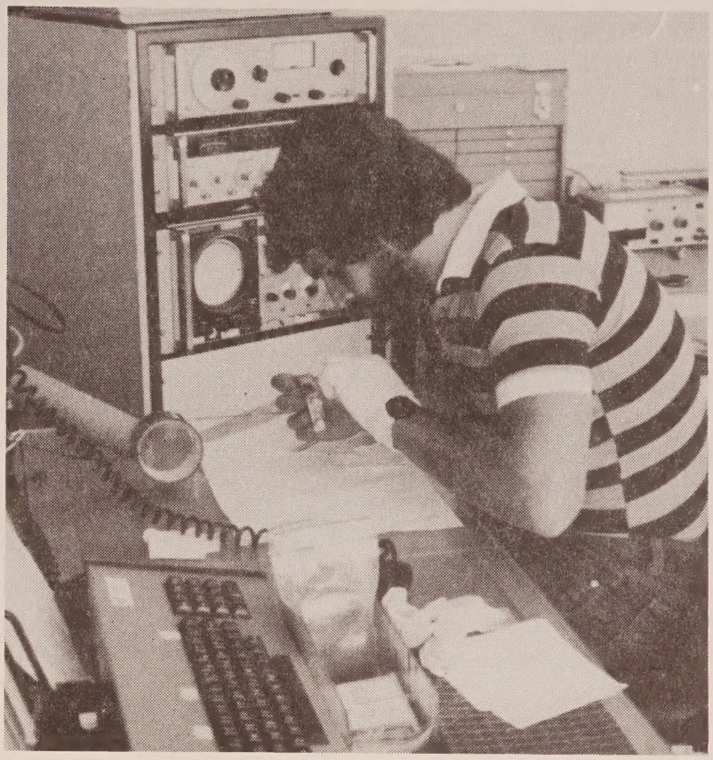
The AMSAT Intern Program was instituted to enable aspirant aerospace technologists to develop their skills in the very special environment surrounding the construction of an "OSCAR." The range of tasks involved in such a project require that a whole battery of talents be brought to bear on it. Mechanical fabrication was easier in the Phase II satellites, but with the advent of Phase III and the appearance of such systems as liquid fuel motors, the complexity as well as the sheer number of jobs to be done has skyrocketed.

With the majority of the mechanical work undertaken by the Washington group being done either by contract (expensive and sometimes unsatisfactory) or by volunteers (scarce) the time was ripe for someone with mechanical skills to fill the "Intern" post which was vacant at that time.

The circumstances which provided us with an eminently well-qualified candidate bear re-telling. The Phase IIIB flight structure was being built under a contract funded largely by a donation from JAMSAT. Previous experience had taught the Phase III engineering team that the fruits of mechanical labor can be described as, at best, highly variable. As a result, the progress of the work on the structure was being closely monitored as it progressed. As it became clear that the standard of workmanship on the structure was about "20 dB" above the norm, interest was aroused, and eventually a close raport developed between the AMSAT personnel and Jorge, who was executing the job for the contractor.

Coincidentally, at the time the structure was delivered it was discovered that Jorge was about to become unemployed. Realizing the close match that existed between his talents and the remaining mechanical work to be done on Phase IIIB, negotiations were begun and soon AMSAT had a new employee/trainee.

Jorge, a native of Argentina, spent his formative years in the city of Cordoba, another of whose sons, Mario Acuna, LU9HBG produced the UoSAT-OSCAR 9 magnetometer. His background is in the construction of specialized mechanical components. Special tools for the aircraft industry, parts for an experimental jet engine, photographic equipment including parts for an esoteric time-lapse-photography system are but a few of the projects he has worked on. Of more direct interest to



AMSAT, perhaps, is his experience in microwave "plumbing." His one complaint, if it can be called that, is that in many of these projects he was only producing a subsystem and never saw a project move from beginning through to completion. Since he has "mothered" the Phase IIIB structure from the time that it was in the form of 8' x 4' sheets of aluminum, it appears AMSAT will put the situation aright when Phase IIIB roars into orbit atop an Ariane rocket on or about July 6, 1982.

Speaking to his lovely wife Anna, it is apparent that Jorge has always had a great interest in the space program, and this was probably one of the motivations that (luckily for AMSAT) brought them to this country. Another reason was his desire to gain more experience on numerically controlled machines of recent design. (The AMSAT lab possesses one such; a drill press with "numerals 1 through 4 embossed on a wheel, denoting depth in inches—HI!)

Working in the ultra-compact "goldfish-bowl" environment of the AMSAT lab is like participating in a carefully choreographed ballet, especially when up to five simultaneous activities may be in progress. A cheerful disposition is essential if one is to avoid becoming an "Oscar the Grouch." Jorge has passed the initiation into the lab with flying colors; there is always a joke and a smile lurking beneath his bearded exterior.

He is also an avid mountaineer, another avocation in which dedication, skill and attention to detail are called for. Although amateur radio is not yet one of his hobbies, he has been noted as asking suspicious numbers of "non-mechanical" questions and has even been caught surreptitiously reading the "License Manual". . . .

So, in the months to come, as more pictures appear in *ASR* and *ORBIT* of Phase IIIB, bear in mind the truly gifted craftsman responsible for its immaculate appearance. He has created something of professional elegance in an organization operating on an amateur budget—something we can all take pride in.—*KE3D*

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